Amendments to the Drawing:

The attached sheet of drawing includes changes to Fig. 6. This sheet replaces the original sheet Fig. 6. In Figure 6, we are simply changing a C (capacitor) to an L (inductor) in block (130) diagram.

REMARKS

Claims 1-20 are pending in the application. Claims 1-19 were rejected. Claim 20 is objected to. Claims 1, 8 and 14 have been amended herein. No claims have been cancelled. Reconsideration of all rejected claims is requested.

I.   Objection to the Drawings

Fig 4 was rejected because it does not include a legend stating that it is prior art. Fig. 4 cannot be considered to be prior art because there are no references that disclose Fig. 4. More specifically, the cited art does not show a transmission line modeled as lumped elements wherein a second port of the transmission line model is connected to a scattering matrix that models dielectric loss. Should this objection be maintained, the applicants request that references be cited showing how Fig. 4 is prior art.

Fig. 6 has been amended as suggested by the examiner. A corrected drawing is attached to this response.

Therefore, the objections to the drawings have been overcome.

II.   Objection to the Specification

The specification was objected to because of discrepancies between figure 4 and page 5, lines 14-15. The specification has been amended to overcome the discrepancies. Accordingly, the objection has been overcome.

III.   Rejection of claims 6 and 19 Under 35 U.S.C. §112, First Paragraph

Claims 6 and 19 recite, in summary, modeling the skin effect resistance and inductance using an R-L tank connected to the second port. The office action states that there is no support for these claims in the specification. The applicant notes that the R-L tank is shown in Fig. 3 and described at page 3, lines 20-22 of the

specification. Therefore, the R-L tank is disclosed and the rejection has been overcome.

IV. Rejection of claim 15 Under 35 U.S.C. §112, Second Paragraph

Claim 15 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite. More specifically, the office action states that there is insufficient antecedent basis for the term "the reflection coefficients."

The applicants respectfully disagree with the rejection. Claim 14, from which claim 15 depends, and claim 15 are directed toward a scattering matrix. Scattering matrices inherently include reflection coefficients, thus, the rejection based on lack of antecedent basis is not proper. In the examples provided in the specification, S_{11} and S_{22} are the reflection coefficients. Because reflection coefficients are inherently part of scattering matrices, the applicants contend that the rejection has been overcome.

V. Rejection of claims 1-13 Under 35 U.S.C. §101

Claims 1-13 were rejected as being directed to non-statutory subject matter.

According to the office action, claims 1-7 are directed merely to an abstract idea of modeling dielectric losses in transmission lines without resulting in a practical application producing a concrete, useful, and tangible result. The office action further states that claims 1-7 are not tangibly embodied because they could be practiced with pencil and paper.

35 U.S.C. §101 states:

Whoever invents or discovers any new and useful **process**, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

(emphasis added)

With regard to the term "process" as used in 35 U.S.C. §101, 35 U.S.C. §100(b) states:

> b) The term "process" means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

The applicants contend that the invention is at least, in part, a process and is useful. Modeling transmission lines tends to be extremely useful. Without modeling, designers and engineers would have to build transmission lines and test their characteristics. If the characteristics are not within predefined specifications, the transmission lines need to be modified and tested again. The modeling allows the transmission line characteristics to be determined before a transmission line is built.

Therefore, claims 1-7 meet the criteria of 35 U.S.C. §101. The applicants note that there is no criteria in 35 U.S.C. §101 regarding producing a "concrete and tangible result" as stated in the office action. Likewise, there is no criteria against patentability based on an invention that is able to be practiced using pencil and paper. The applicants note that if such criteria were applicable, all computer and software patents would be void.

Should this rejection be maintained, the applicants request some legal authority to deny a patent based on not producing a concrete and tangible result. Likewise, the applicants request some legal authority to deny a patent because the invention can be practiced with a pencil and paper. Based on the foregoing, the rejections of claims 1-7 have been overcome.

CLAIMS 8-13

Claims 8-13 were rejected because, according to the office action, they are directed merely to an abstract idea for simulating a transmission line without resulting in a practical application producing a concrete, useful, and tangible result. The office action further states that the claims are not tangibly embodied because they could be practiced with pencil and paper.

The applicants incorporate the responses to the rejections of claims 1-7 into this response. As stated above, modeling or simulating transmission lines is very useful and the office action does not provide any legal authority for the rejections. As with claims 1-7, should these rejections be maintained, the applicants request some legal authority to deny a patent based on not producing a concrete and tangible result. Likewise, the applicants request some legal authority to deny a patent because the invention can be practiced with a pencil and paper. Based on the foregoing, the rejections of claims 8-13 have been overcome.

VI. Recommendations

The office action offered some very good recommendations for the claims. The applicants have amended the claims to reflect these recommendations and the applicants thank the examiner for these recommendations.

VII. Rejection of claims 1, 3-12, 14, and 16-19 Under 35 U.S.C. §103(a)

Claims 1, 3-12, 14, and 16-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Yu publication, entitled, "Computational Models of Transmission Line with Skin Effects and Dielectric Loss" in view of the applicants' assertions.

CLAIM 1

Claim 1 is reprinted for convenience as follows:

A method of modeling dielectric losses in a transmission line, the method comprising:
modeling a resistance, a self-inductance, and a self-capacitance for a transmission line as a lumped element circuit having a first port and a second port, where a signal is received on the first port; and

modeling a dielectric loss as a scattering matrix connected to the second port.

(emphasis added)

According to the office action, Yu does not disclose the modeled dielectric loss as a scattering matrix connected to the second port. The office action, however, states that Yu discloses cascading a number of 2-port cells, which can be represented by a two-port matrix. The office action then cites the application at page 4, lines 4-5 to hold that an S-parameter matrix, [S], refers to any matrix used to represent a two port circuit element. The office action concludes that it would have been obvious to modify the teachings of Yu to incorporate the Applicants' assertions to obtain the invention of claim 1 because, based on Applicants' assertions, Yu's model would be interpreted as a scattering matrix connected to the second port.

The applicants respectfully disagree with the conclusions set forth in the office action. The applicants agree that page 4, lines 4-5 states that a scattering matrix refers to any matrix used to represent a two port circuit element. Lines 6-7 further state that the scattering matrix relates to the voltage waves incident on the ports to those reflected from the ports.

As set forth in the office action, Yu discloses the model of Y_d as a simple parallel or serial connection of a port. Y_d, however, is not represented as a scattering matrix because Y_d does not relate to voltage waves incident on the ports to those reflected from the ports. Rather, Y_d is simply a frequency dependent function. Contrary to the office action, Yu's function of Y_d would not and cannot be interpreted as a scattering matrix.

The office action further states that Yu discloses cascading a number of two-port cells, which would effectively represent Y_d as a two-port matrix via the cascading. The applicants contend that this is too far of a stretch of Yu to render claim 1 obvious. For example, Yu does not disclose any cascading related to Y_d. Accordingly, any cascading disclosed in Yu would not be applicable to converting Y_d to a two-port device as claimed in claim 1. Should this rejection be maintained, the applicants respectfully request that the examiner show how to modify the teaching of Yu to as to disclose the claimed scattering matrix.

Based on the foregoing, the applicants contend that the rejection has been overcome.

CLAIM 2-7

Claims 2-7 are dependent on claim 1 and are deemed allowable by way of their dependence and for other reasons. Therefore, the applicants request reconsideration of the rejections.

CLAIM 8

Claim 8, as amended herein, is reprinted for convenience as follows:

A method for simulating a transmission line comprising;

determining a resistance of a transmission line;

determining a self-inductance of the transmission line;

determining a self-capacitance of the transmission line;

creating a computer model of the line as a schematic having first and second ports;

modeling the resistance as a resistor in series with an inductor that represents the self-inductance;

modeling the self-capacitance as a capacitor connected to the transmission line; and

modeling a dielectric loss as a scattering matrix connected to the second port, wherein the scattering matrix represents conductance of the transmission line across a band of frequencies.

Claim 8 was rejected on many of the same grounds as claim 1. Therefore, the applicants incorporate the rebuttals to the rejection of claim 1 into this rebuttal. Claim 8 includes the element of "modeling a dielectric loss as a scattering matrix connected to the second port." As set forth above, Yu does not disclose any scattering matrix. Therefore, Yu cannot render claim 8 obvious

Based on the foregoing, the applicants contend that the rejection of claim 8 has been overcome and request reconsideration of the rejection.

CLAIM 9-12

Claims 9-12 are dependent on claim 8 and are deemed allowably by way of their dependence and for other reasons. Therefore, the applicants request reconsideration of the rejections.

CLAIM 14

Claim 14 is independent and is reprinted for convenience as follows:

A computer-readable medium having computer-executable instructions for performing a method for modeling transmission lines, the method comprising:

modeling a resistance, a self-inductance, and a self-capacitance for a transmission line as a lumped element circuit having a first and second port, where a signal is received on the first port; and

modeling a dielectric loss as a scattering matrix connected to the second port.

Claim 14 was rejected on many of the same grounds as claim 1. Therefore, the applicants incorporate the rebuttals to the rejection of claim 1 into this rebuttal. Claim 14 includes the element of "modeling a dielectric loss as a scattering matrix connected to the second port." As set forth above, Yu does not disclose any scattering matrix. Therefore, Yu cannot render claim 14 obvious.

Based on the foregoing, the applicants contend that the rejection of claim 14 has been overcome and request reconsideration of the rejection.
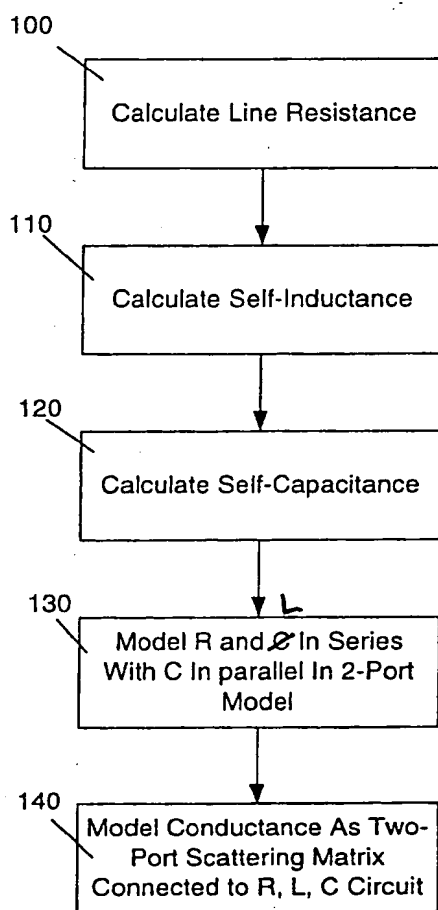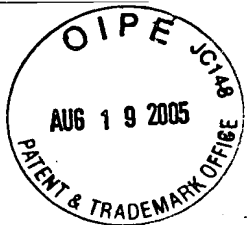
CLAIM 15-19

Claims 15-19 are dependent on claim 14 and are deemed allowably by way of their dependence and for other reasons. Therefore, the applicants request reconsideration of the rejections.

In view of the above, all of the pending claims are now believed to be in condition for allowance and a notice to that effect is earnestly solicited.

Respectfully submitted,

KLAAS, LAW, O'MEARA & MALKIN, P.C.

Dated: August 17, 2005   By: _____

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100

Calculate Line Resistance

110

Calculate Self-Inductance

120

Calculate Self-Capacitance

130

Model R and $\mathcal{L}$ In Series
With C In parallel In 2-Port
Model

140

Model Conductance As Two-
Port Scattering Matrix
Connected to R, L, C Circuit

Fig. 6